

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (*Currently Amended*): A design processing apparatus comprising:
an operation section configured to perform an operation in accordance with a method of
designing an optical system using an evaluation function;
an input section which inputs information required for the operation;
an output section which outputs an operation result; and
a memory section which memorizes the operation result,
wherein the method of designing an optical system comprising comprises:
a setting an initial-value step for setting an initial that sets a value which sets up of an
optical parameter in a design state where a production error has not been taken into
consideration,
a generating/renewing production-state step for making/renewing, where an that
generates a value of the optical parameter in a production is-made state by adding the a
production error to the optical parameter in the design state, or renewing the production error of
the optical parameter in an existing production state is renewed,
a generating an evaluation-function step for making the that generates an evaluation
function which makes the evaluation function, and
a performing optimization step for performing optimization which determines by
determining an optimal value of the optical parameter by optimizing the evaluation function.

2. (*Currently Amended*): The design method of an optical system processing apparatus
according to claim 1, wherein:

in the generating/renewing production-state step for making for the production
state-renewing, a quantity, an amount of the production error to be applied is acquired, based
on a basis of a value in a an error-amount table of an amount of error, which has been established
beforehand preliminarily prepared according to a requirement for acquisition of an amount of a

production error, to newly generate the optical parameter in the production state by applying the amount of the production error is applied to an to the optical parameter in the design state, and thus an optical parameter in the production state is newly made, or to renew a value of the amount of the production error, which has been applied to generate the optical parameter in the existing production state is renewed, according to a change of the optical parameter in the design state.

3. (*Currently Amended*): The design method of an optical system processing apparatus according to claim 1, wherein:

in the generating evaluating-function step for making an evaluation function, at least one production error sensitivity parameter determined, based on the representing sensitivity to production error, which parameter is defined by optical performance of in the design state and optical performance in the production state, is included incorporated as an evaluation parameter, in addition to the evaluation parameter of the evaluation function.

4. (*Currently Amended*): A design processing apparatus comprising:
an operation section for performing an operation in accordance with a method of designing an optical system;

an input section which inputs information required for the operation;

an output section which outputs an operation result; and

a memory section which memorizes the operation result,

wherein the method of designing an optical system comprising:

a setting an initial-value step for setting an initial value which sets up a value in a design state as a value of an optical parameter,

a generating a production-state step for setting a production state which sets up a value in the a production state as a value of an the optical parameter,

a generating an evaluation-function step for making that generates an evaluation function which makes an evaluation function in which a using the production state is as a variable, and

a performing optimization step for performing optimization which optimizes by optimizing the evaluation function,

wherein a the value in the production state is set up by adding a predetermined amount of production error to the value in the design state.

5. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 4, wherein ~~an~~ the amount of production error is determined, ~~based on a basis~~ of a value of a in an error-amount table ~~of an amount of error~~.

6. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 5, wherein ~~a value of values in the error-amount table of an amount of error is~~ determined, based are set on ~~an~~ a basis of actual production ~~function~~ capability.

7. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 5, wherein ~~a the error-amount table of an amount of error is composed by as a~~ combination of ~~a kind of~~ one or more production ~~error~~ errors and ~~a kind of~~ one or more optical parameter parameters.

8. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 5, wherein the ~~kind of error-amount table contains one or more~~ production ~~error contains~~ errors including at least one of Newton error, astigmatism, a wall thickness error, a tilt eccentricity, and a shift eccentricity.

9. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 5, wherein the ~~kind of error-amount table contains one or more~~ optical parameter ~~contains~~ parameters including at least one of a radius of curvature, a lens thickness, and ~~a lens~~ interlens interval.

10. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 5, wherein ~~a range in which~~ possible range of an optical parameter ~~can be taken in the error table~~ is divided into two or more numerical value ranges in the error-amount table.

11. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 10, wherein an amount of error is set ~~up to~~ for each of ~~the~~ two or more numerical value ranges in the error-amount table.

12. (*Currently Amended*): The ~~design method of an optical system~~ processing apparatus according to claim 4, ~~wherein further comprising a renewing the production-state that step for renewing a production state further provided, and the step for renewing a production state is renewed~~ renews the amount of the production error to a new production-error value in accordance with a change of the value of the optical parameter in a design state, based on a basis of the error-amount table of an amount of error.

13. (*Cancelled*).